

HM10474

1024-word × 4-bit Fully Decoded Random Access Memory

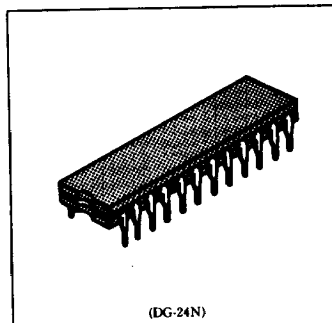
The HM10474 is ECL 10k compatible, 1024-words × 4-bit, read write, random access memory developed for high speed systems such as scratch pads and control/buffer storages.

The fabrication process is the Hitachi's low capacitance, oxide isolation method with double metalization.

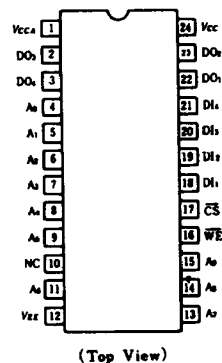
The HM10474 is encapsulated in cerdip-24pin package, compatible with Fairchild's F10474.

FEATURES

- 1024-word × 4-bit organization
- Fully compatible with 10K ECL level
- Address access time: 25ns (max)
- Write pulse width: 25ns(min)
- Low power dissipation: 0.2mW/bit
- Output obtainable by wired-OR (open emitter)



PIN ARRANGEMENT

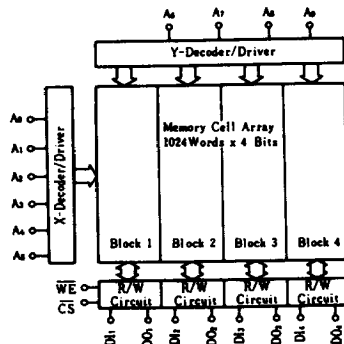


TRUTH TABLE

Input			Output	Mode
CS	WE	Din		
H	x	x	L	Not Selected
L	L	L	L	Write "0"
L	L	H	L	Write "1"
L	H	x	Dout*	Read

Notes) x : Irrelevant
 * : Read Out Noninvert

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Item	Symbol	Rating	Unit
Supply Voltage	V _{EE} to V _{CC}	+0.5 to -7.0	V
Input Voltage	V _{in}	+0.5 to V _{EE}	V
Output Current	I _{out}	-30	mA
Storage Temperature	T _{stg}	-65 to +150	°C
Storage Temperature	T _{stg} (Bias)*	-55 to +125	°C

* Under Bias



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■ ELECTRICAL CHARACTERISTICS

● DC CHARACTERISTICS ($V_{EE} = -5.2V$, $R_L = 50\Omega$ to $-2.0V$, $T_a = 0$ to $+75^\circ C$, air flow exceeding 2m/sec)

Item	Symbol	Test Condition		min(B)	typ	max(A)	Unit	
Output Voltage	V_{OH}	$V_{IH} = V_{IH1}$ or V_{IL1}		0°C	-1000	—	-840	mV
				+25°C	-960	—	-810	
				+75°C	-900	—	-720	
	V_{OL}			0°C	-1870	—	-1665	
				+25°C	-1850	—	-1650	
				+75°C	-1830	—	-1625	
Output Threshold Voltage	V_{OH1}	$V_{IH} = V_{IH1}$ or V_{IL1}		0°C	-1020	—	—	mV
				+25°C	-980	—	—	
				+75°C	-920	—	—	
	V_{OL1}			0°C	—	—	-1645	
				+25°C	—	—	-1630	
				+75°C	—	—	-1605	
Input Voltage	V_{IH}	Guaranteed Input Voltage High for All Inputs		0°C	-1145	—	-840	mV
				+25°C	-1105	—	-810	
				+75°C	-1045	—	-720	
	V_{IL}	Guaranteed Input Voltage Low for All Inputs		0°C	-1870	—	-1490	
				+25°C	-1850	—	-1475	
				+75°C	-1830	—	-1450	
Input Current	I_{IH}	$V_{IH} = V_{IH1}$	$V_{IH} = V_{IL1}$	0 to +75°C	—	—	220	μA
	I_{IL}	CS		0 to +75°C	0.5	—	170	
		Others			-50	—	—	
Supply Current	I_{EX}	All Input and Output Open, Test Pin 12		$T_a = 0^\circ\text{C}$	-200	-160	—	mA
				$T_a = 75^\circ\text{C}$	—	-145	—	

● AC CHARACTERISTICS ($V_{EE} = -5.2V \pm 5\%$, $T_a = 0$ to $+75^\circ C$, air flow exceeding 2m/sec)

1. READ MODE

Item	Symbol	Test Condition	min	typ	max	Unit
Chip Select Access Time	t_{ACS}		-	-	10	ns
Chip Select Recovery Time	t_{RCS}		-	-	10	ns
Address Access Time	t_{AA}		-	15	25	ns

2. WRITE MODE

Item	Symbol	Test Condition	min	typ	max	Unit
Write Pulse Width	t_W	$t_{W1} = 3ns$	25	15	-	ns
Data Setup Time	t_{WSD}		2	-	-	ns
Data Hold Time	t_{WHD}		2	-	-	ns
Address Setup Time	t_{W1A}	$t_W = t_{W1A}$	3	-	-	ns
Address Hold Time	t_{W1A}		2	-	-	ns
Chip Select Setup Time	t_{WCS}		2	-	-	ns
Chip Select Hold Time	t_{WCS}		2	-	-	ns
Write Disable Time	t_{WD}		-	-	10	ns
Write Recovery Time	t_{WR}		-	-	27	ns



3. RISE/FALL TIME

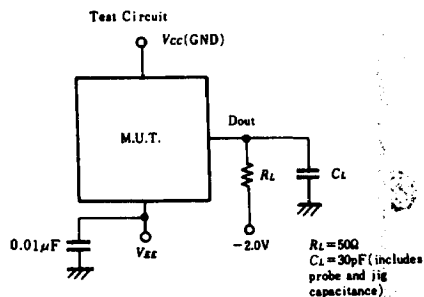
Item	Symbol	Test Condition	min	typ	max	Unit
Output Rise Time	t_r		—	2	—	ns
Output Fall Time	t_f		—	2	—	ns

4. CAPACITANCE

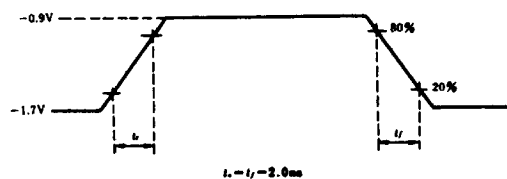
Item	Symbol	Test Condition	min	typ	max	Unit
Input Capacitance	C_{in}		—	4	—	pF
Output Capacitance	C_{out}		—	7	—	pF

■ TEST CIRCUIT AND WAVEFORMS

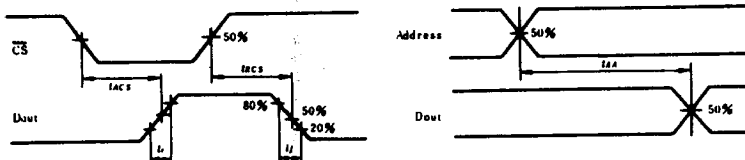
1. LOADING CONDITION



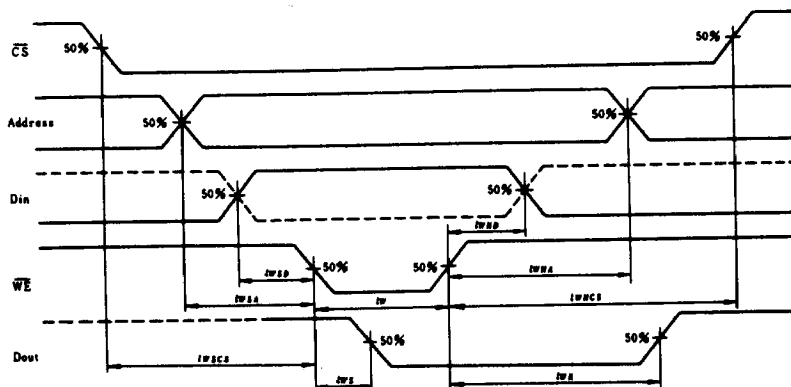
2. INPUT PULSE



3. READ MODE

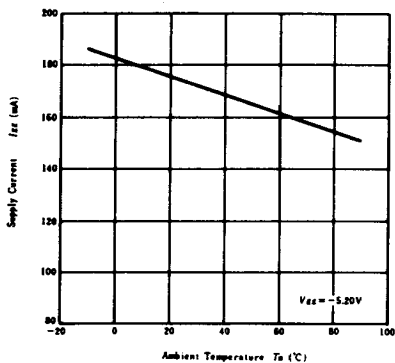


4. WRITE MODE

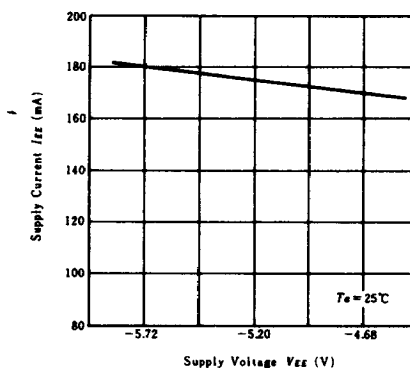


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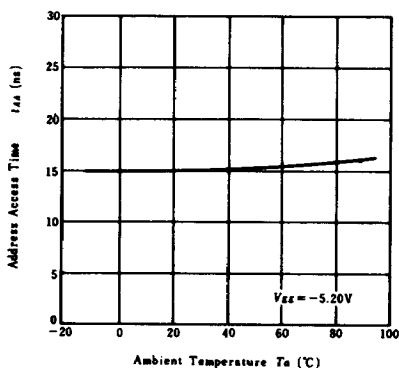
**SUPPLY CURRENT vs.
AMBIENT TEMPERATURE**



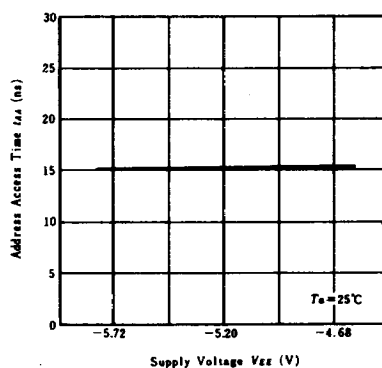
**SUPPLY CURRENT vs.
SUPPLY VOLTAGE**



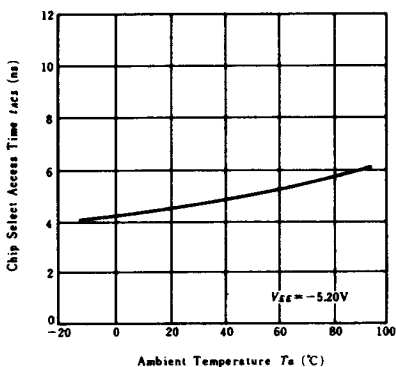
**ADDRESS ACCESS TIME
vs. AMBIENT TEMPERATURE**



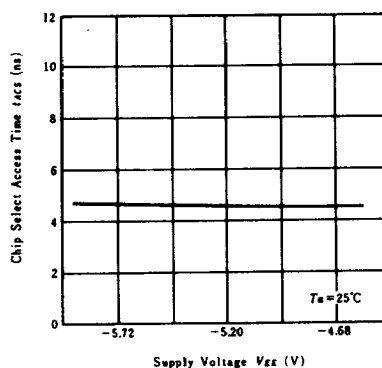
**ADDRESS ACCESS TIME
vs. SUPPLY VOLTAGE**

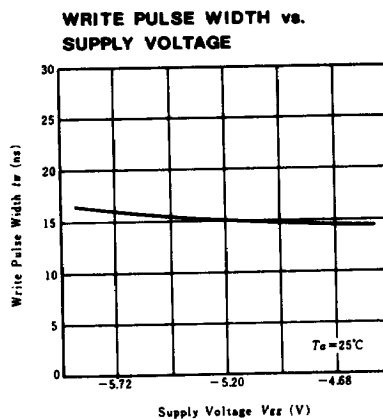
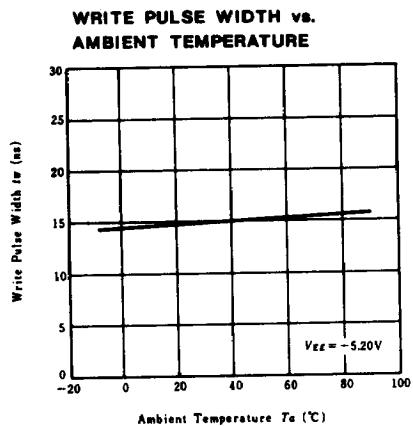


**CHIP SELECT ACCESS TIME
vs. AMBIENT TEMPERATURE**



**CHIP SELECT ACCESS TIME
vs. SUPPLY VOLTAGE**





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